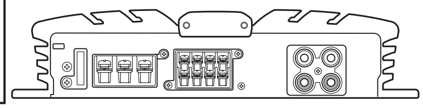
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
CRT2167

BRIDGEABLE POWER AMPLIFIER

GM-X422 X1R/UC, ES, EW
GM-X322 X1R/UC

CONTENTS

1. SAFETY INFORMATION 1
2. EXPLODED VIEWS AND PARTS LIST.......................2
3. SCHEMATIC DIAGRAM 6
4. PCB CONNECTION DIAGRAM 8
5. ELECTRICAL PARTS LIST 12
6. ADJUSTMENT...14
7. GENERAL INFORMATION 15
   7.1 DISASSEMBLY 15
8. OPERATIONS AND SPECIFICATIONS....................16

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should mot risk trying to do so and refer the repair to a qualified service technician.

UC model

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE, PTE.LTD. 501 Orchard Road, #10-00, Wheelock Place, Singapore 238880

K-ZEU. JAN. 1998 Printed in Japan

2. EXPLODED VIEWS AND PARTS LIST

2.1. PACKING

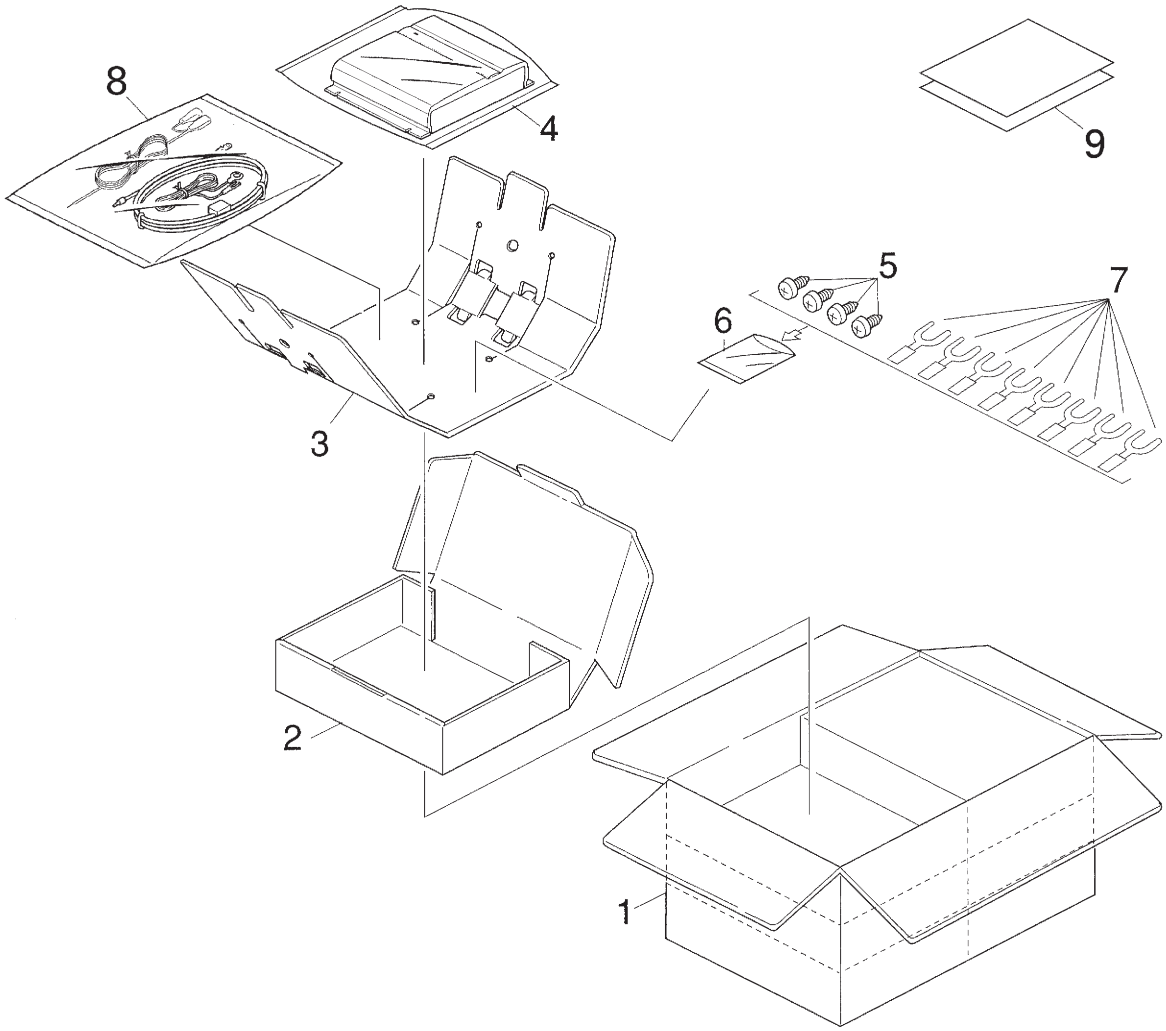


Fig. 1

NOTE:

- Parts marked by "*"are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.

(1) PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Contain Box	See Contrast table (2)
	2	Carton	See Contrast table (2)
	3	Protector	HHP0020
	4	Polyethylene Bag	HEG0010
	5	Screw(x4)	BYC40P180FZK
	6	Polyethylene Bag	HEG0011
	7	Terminal(x8)	See Contrast table (2)
	8	Cord Assy	See Contrast table (2)
	9-1	Owner's Manual	See Contrast table (2)
	9-2	Owner's Manual	See Contrast table (2)
*	9-3	Warranty Card	HRY1070
*	9-4	Caution Card	See Contrast table (2)
*	9-5	Card	See Contrast table (2)

(2) CONTRAST TABLE

GM-X422/X1R/UC, GM-X422/X1R/ES, GM-X422/X1R/EW and GM-X322/X1R/UC are constructed the same except for the following:

Mark	No.	Symbol and Description	Part No.			
			GM-X422			GM-X322
			X1R/UC	X1R/ES	X1R/EW	X1R/UC
	1	Contain Box	HHL0134	HHL0135	HHL0136	HHL0133
	2	Carton	HHG0134	HHG0135	HHG0136	HHG0133
	7	Terminal(x8)	HKC0001	HKC0003	HKC0003	HKC0003
	8	Cord Assy	Not used	HDE4419	HDE4419	Not used
	9-1	Owner's Manual	HRD0048	HRD0045	HRD0047	HRD0046
	9-2	Owner's Manual	Not used	HRD0049	Not used	Not used
*	9-3	Warranty Card	HRY1070	Not used	HRY1087	Not used
*	9-4	Caution Card	HRP0006	Not used	Not used	Not used
*	9-5	Card	Not used	Not used	Not used	ARY1048

● Owner's Manual

Model	Part No.	Language
GM-X422/X1R/UC	HRD0048	English, French
GM-X422/X1R/ES	HRD0045	English, Spanish
	HRD0049	Arabic, Portuguese(B)
GM-X422/X1R/EW	HRD0047	English, French, German, Dutch, Spanish, Italian
GM-X322/X1R/UC	HRD0046	English, French

2.2. EXTERIOR

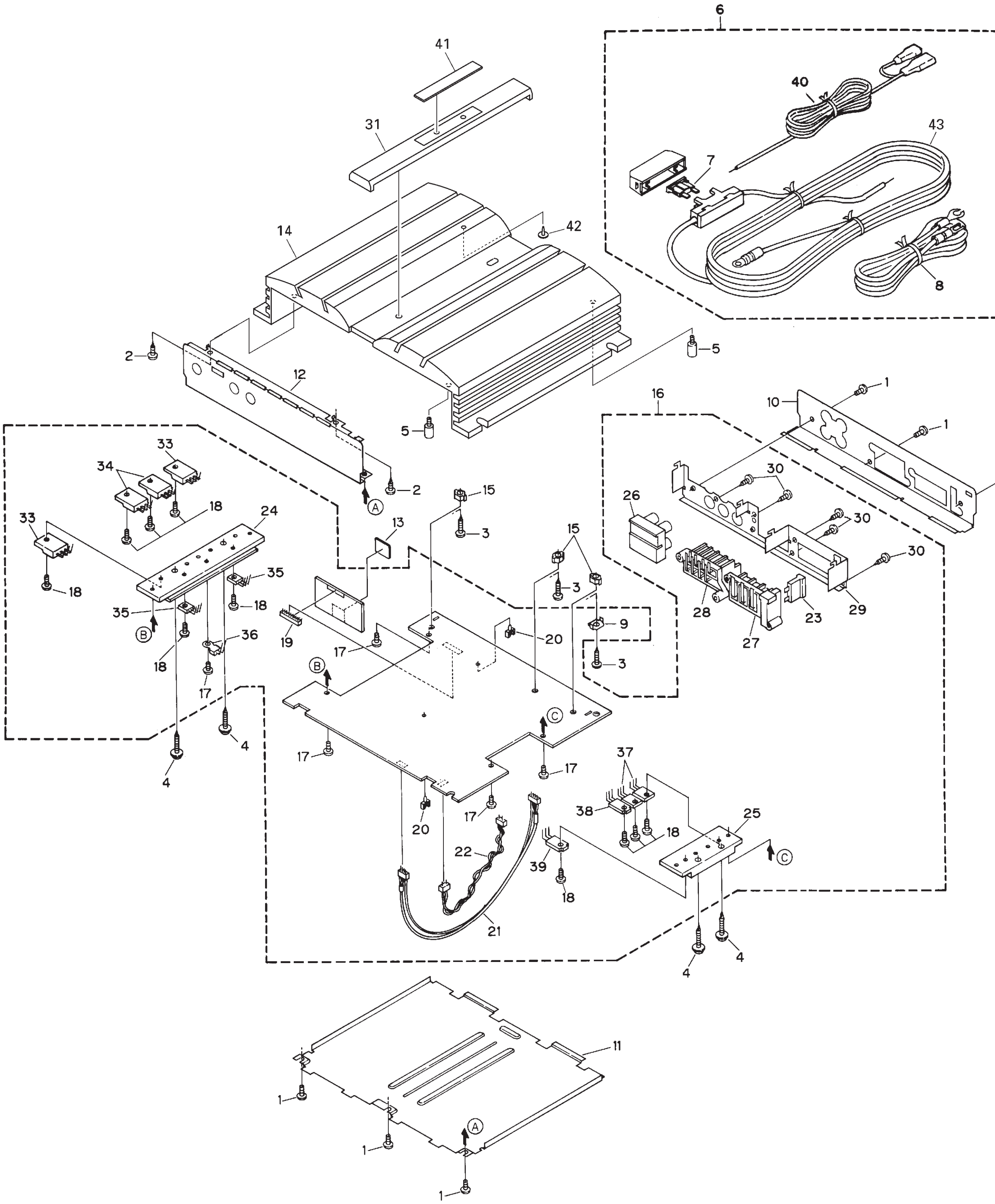


Fig. 2

(1) EXTERIOR SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BSZ30P050FZK
	2	Screw(M3x6)	CBA1320
	3	Screw(M3x12)	CBA1323
	4	Screw	CBA1382
	5	Screw	HBA0006
	6	Cord Assy	See Contrast table (2)
	7	Fuse(15A)	See Contrast table (2)
	8	Ground Wire(Black)	See Contrast table (2)
	9	Holder	CNC5399
	10	Panel	See Contrast table (2)
	11	Case	HNB0016
	12	Panel	See Contrast table (2)
	13	Spacer	HNM0026
	14	Heat Sink	See Contrast table (2)
	15	Spacer	HNV3975
	16	Amp Unit	See Contrast table (2)
	17	Screw	BMS30P060FZK
	18	Screw	BMS30P080FMC
	19	Plug(CN855)	CKS1618
	20	Clamper	HNV0006

Mark	No.	Description	Part No.
	21	Connector(CN853)	HDE4418
	22	Cord(CN551)	HDE4610
	23	Fuse(20A)	HEK0020
	24	Heat Sink(Sub Heat Sink)	HNR0053
	25	Heat Sink(Sub Heat Sink)	HNR0054
	26	Pin Jack(CN851)	See Contrast table (2)
	27	Terminal(CN901)	See Contrast table (2)
	28	Terminal(CN651)	See Contrast table (2)
	29	Holder	HNC0006
	30	Screw	PPZ30P060FZK
	31	Plate Unit	See Contrast table (2)
	32	•••••	
	33	Transistor(Q561,562)	2SD2438
	34	Transistor(Q563,564)	2SB1587
	35	Transistor(Q555,556)	2SD2343
	36	Thermistor(TH901)	CCX1013
	37	FET(Q905,906)	IRFIZ44N
	38	Diode(D907)	ESAC25M-02C
	39	Diode(D910)	ESAC25M-02N
	40	System Remote Control	See Contrast table (2)
	41	Badge Unit	See Contrast table (2)
	42	Light Pipe Unit	HXA0182
	43	Special Red Battery Wire	See Contrast table (2)

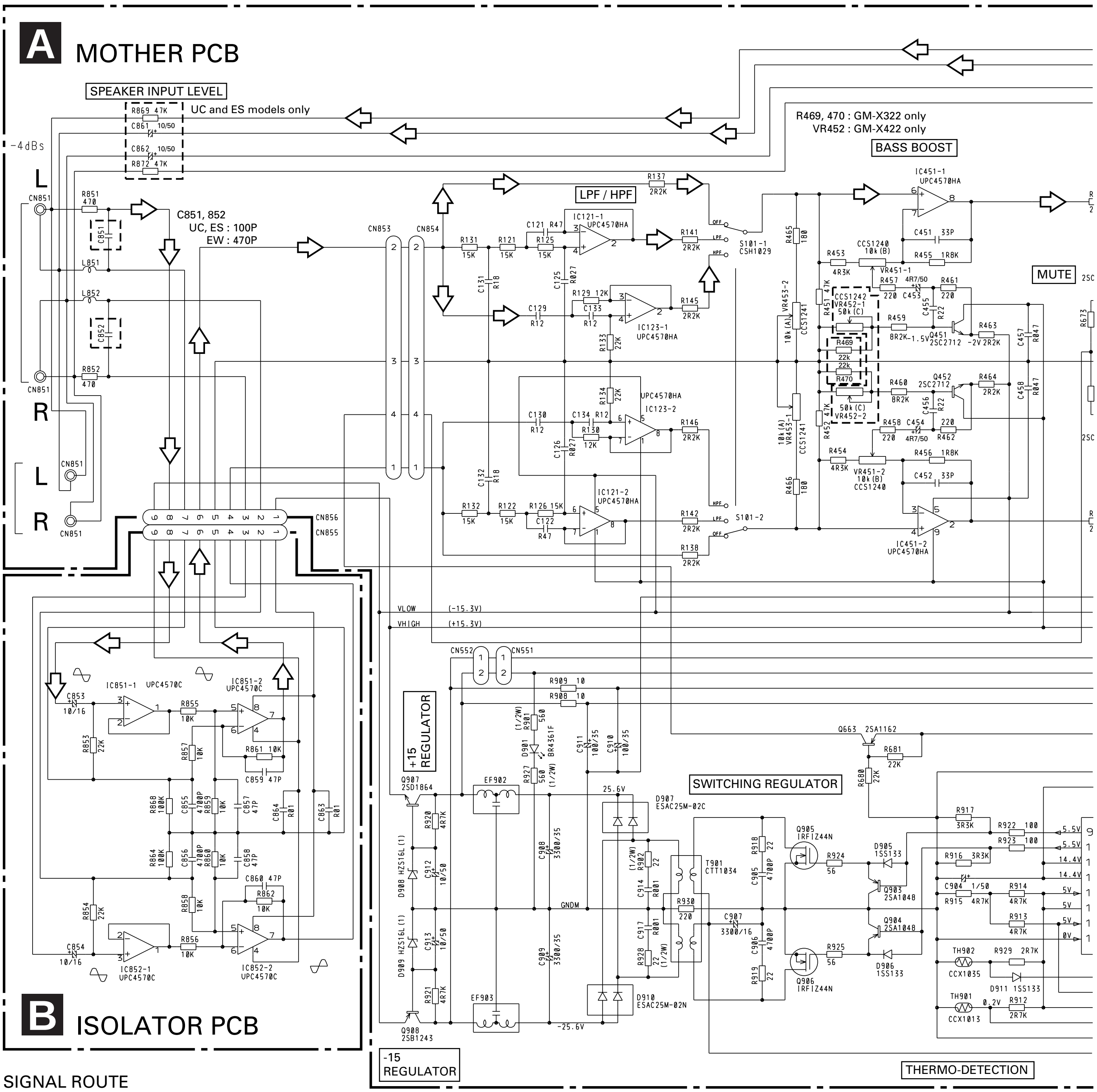
(2) CONTRAST TABLE

GM-X422/X1R/UC, GM-X422/X1R/ES, GM-X422/X1R/EW and GM-X322/X1R/UC are constructed the same except for the following:

			Part No.			
			GM-X422			GM-X322
Mark	No.	Symbol and Description	X1R/UC	X1R/ES	X1R/EW	X1R/UC
	6	Cord Assy	Not used	HDE4453	HDE4453	Not used
	7	Fuse(15A)	Not used	HEK0015	HEK0015	Not used
	8	Ground Wire(Black)	Not used	HDE4455	HDE4455	Not used
	10	Panel	HNB0055	HNB0073	HNB0056	HNB0058
	12	Panel	HNB0050	HNB0072	HNB0072	HNB0051
	14	Heat Sink	HNR0092	HNR0099	HNR0099	HNR0096
	16	Amp Unit	HWH0059	HWH0057	HWH0056	HWH0058
	26	Pin Jack(CN851)	HKB0006	HKB0005	HKB0005	HKB0003
	27	Pin Jack(CN901)	HKE0002	HKE0001	HKE0001	HKE0001
	28	Pin Jack(CN651)	HKE0008	HKE0007	HKE0003	Not used
	31	Plate Unit	HXA0166	HXA0163	HXA0163	HXA0163
	40	System Remote Control	Not used	HDE0007	HDE0007	Not used
	41	Badge Unit	HXA0168	HXA0164	HXA0164	HXA0164
	43	Special Red Battery Wire	Not used	HDE4454	HDE4454	Not used

3. SCHEMATIC DIAGRAM

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



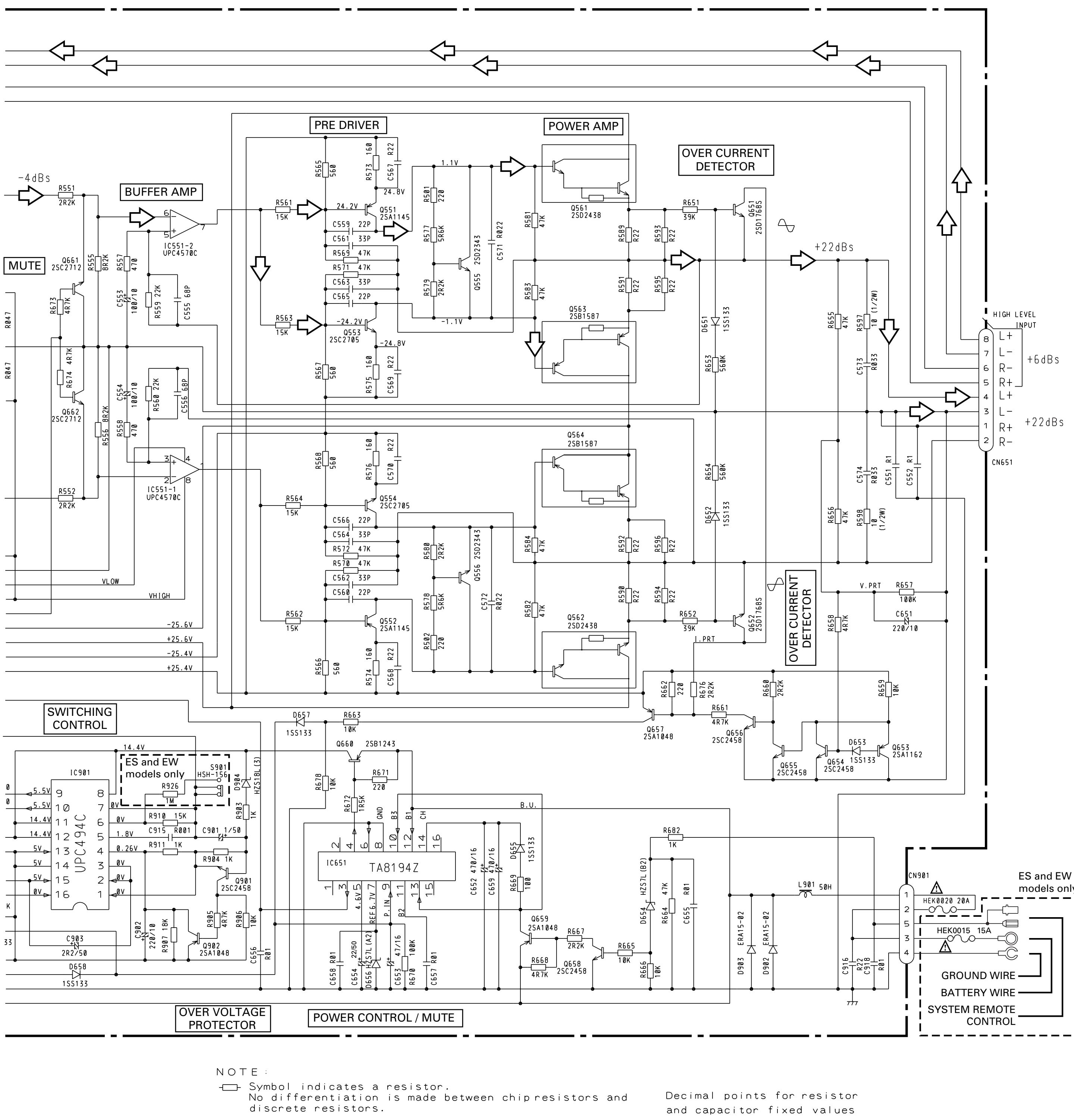
SIGNAL ROUTE

⇨: AUDIO SIGNAL

AMP UNIT
Consists of MOTHER PCB ISOLATOR PCB

SWITCHES:
MOTHER PCB
S101: LPF/HPF SWITCH····LPF-OFF-HPF
S901: BFC SWITCH········LOW-HIGH

The underlined indicates the switch position.



NOTE :

—▭— Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

—|⊢ Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

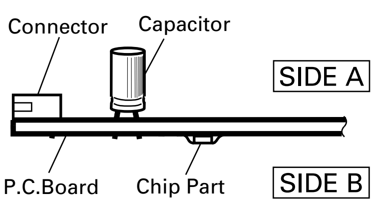
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

Fig. 3

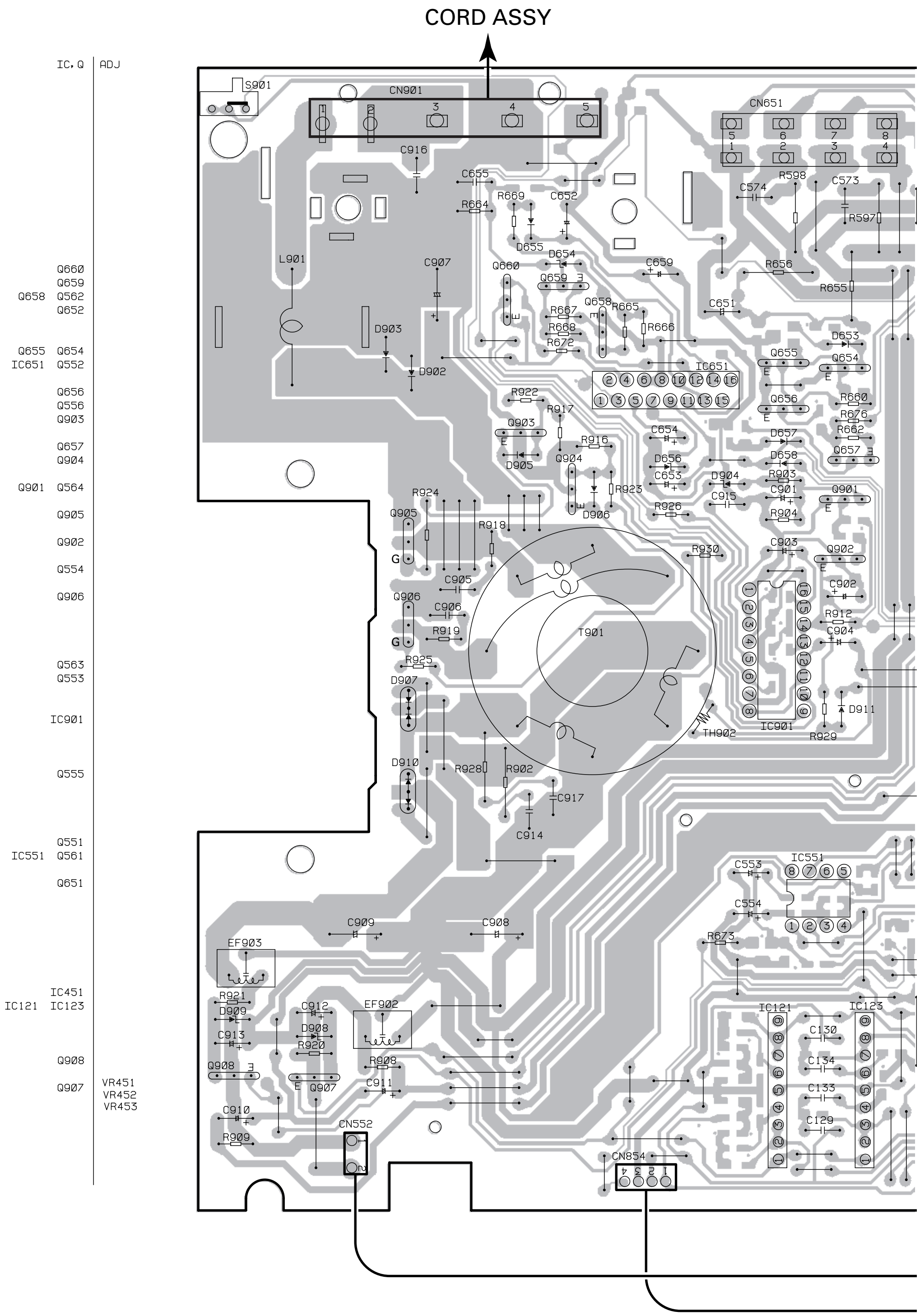
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS

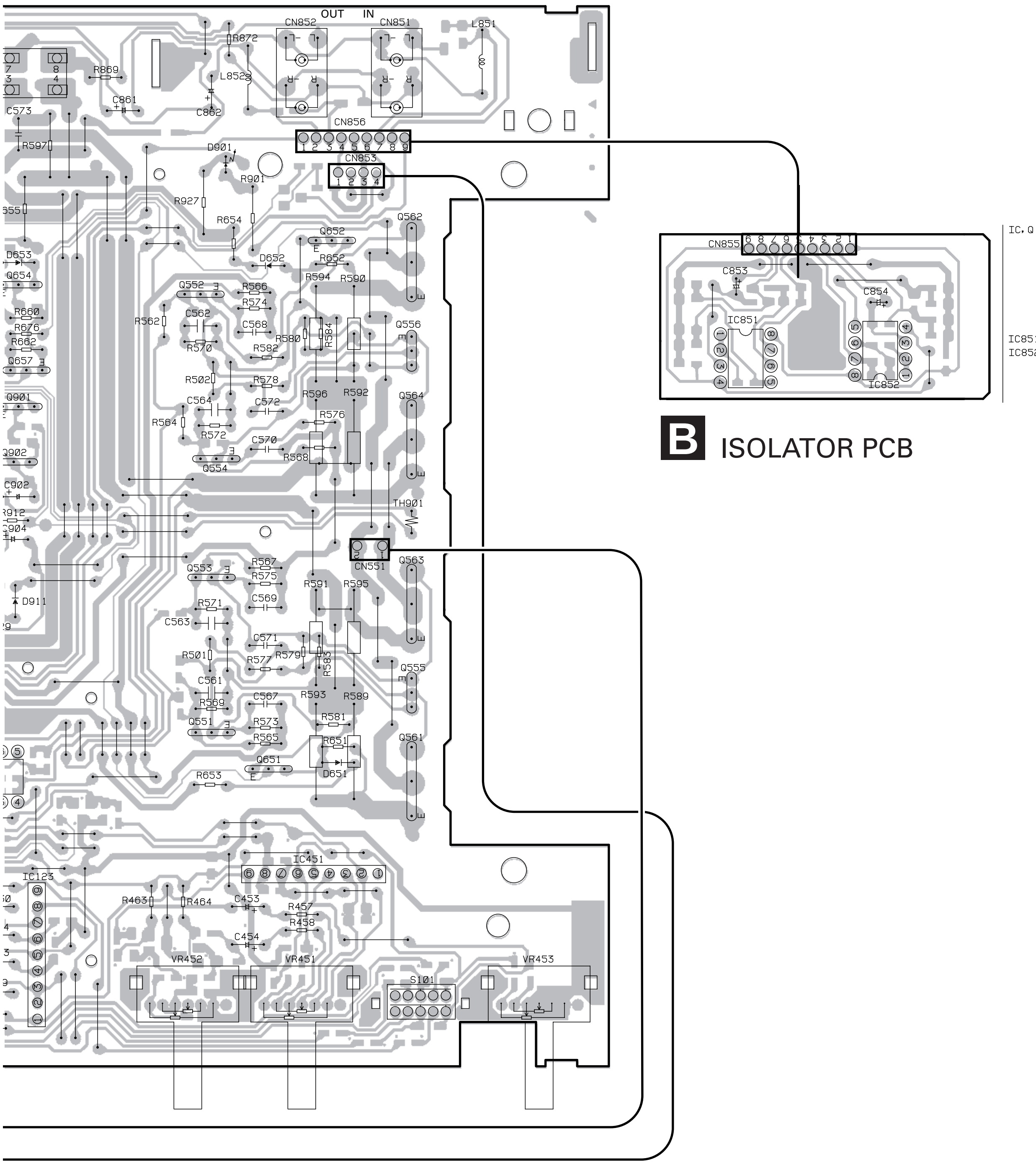
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



A MOTHER PCB



SIDE A

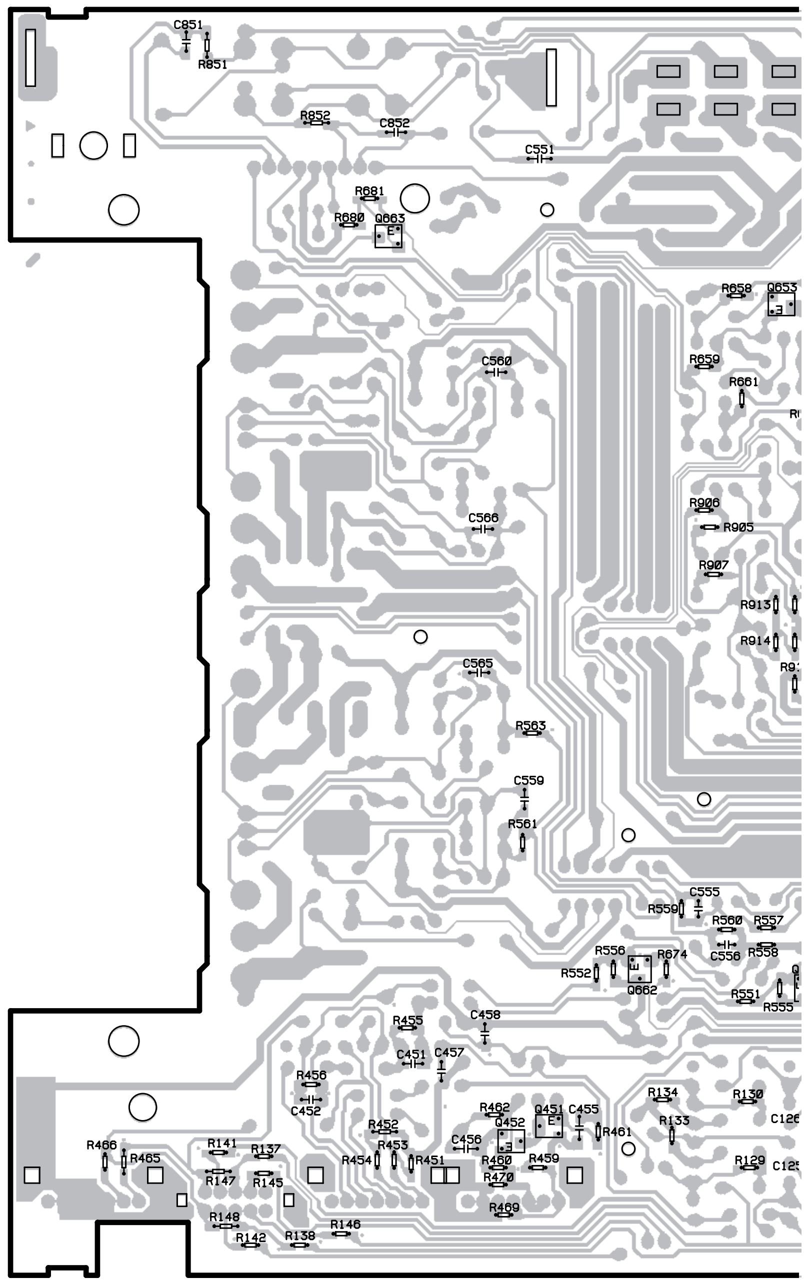


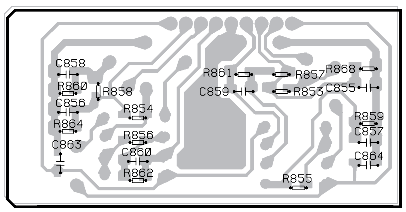
B ISOLATOR PCB

Fig. 4

A B

A MOTHER PCB





B ISOLATOR PCB

SIDE B

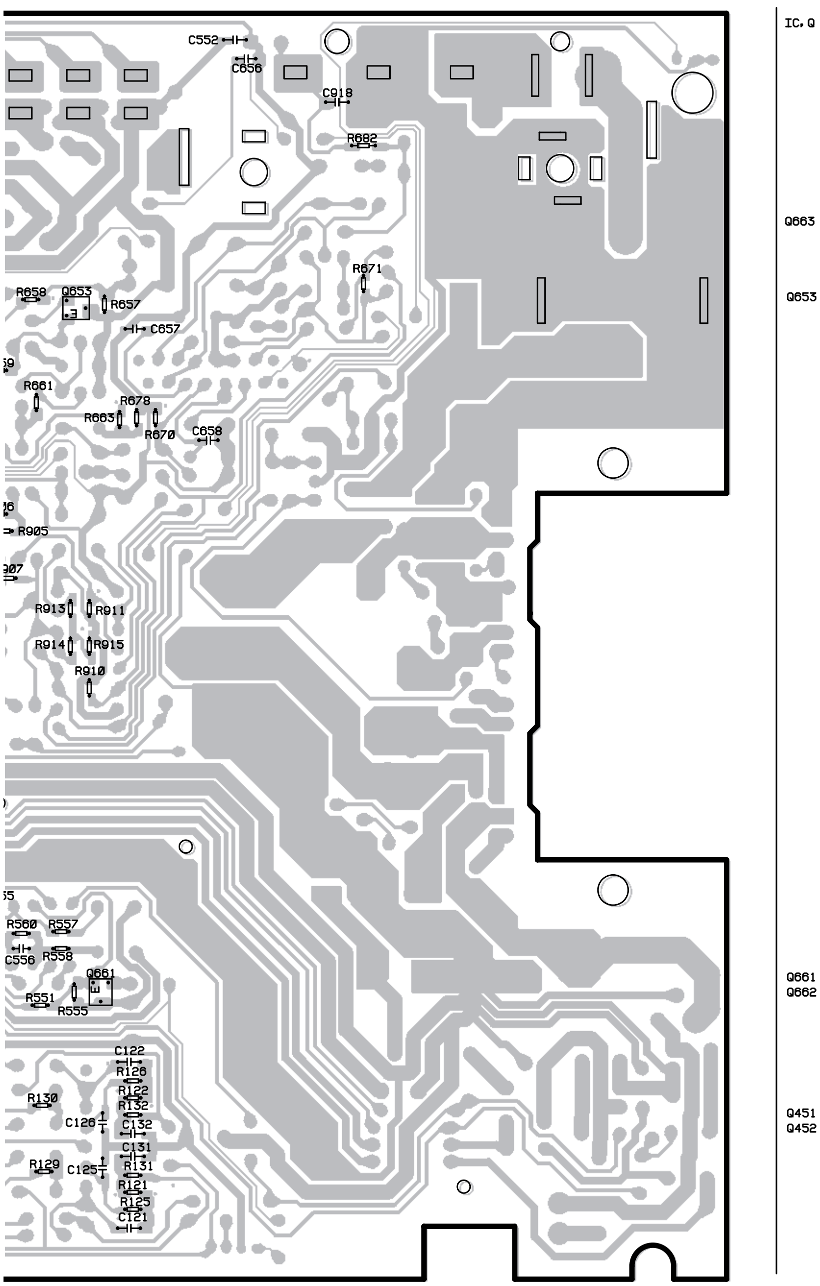

C552
C656
C918
R682
R671
R658
Q653
R657
C657
R661
R678
R663
R670
C658
R905
R913
R911
R914
R915
R910
R560
R557
C556
R558
Q661
R551
R555
C122
R128
R122
R130
R132
C126
C132
C131
R129
C125
R131
R121
R125
C121
IC,Q
Q663
Q653
Q661
Q662
Q451
Q452

Fig. 5

5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

  Chip Resistor

  RS1/○S○○○J,RS1/○○S○○○J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....

=====Circuit Symbol and No.===Part Name Part No.

GM-X422/X1R/UC

AMP UNIT
Consists of MOTHER PCB ISOLATOR PCB

A B Unit Number : HWH0059
Unit Name : Amp Unit

MISCELLANEOUS

Symbol	No.	Part Name	Part No.
IC	121	IC	UPC4570HA
IC	123	IC	UPC4570HA
IC	451	IC	UPC4570HA
IC	551	IC	UPC4570C
IC	651	IC	TA8194Z
IC	851	IC	UPC4570C
IC	852	IC	UPC4570C
IC	901	IC	UPC494C
Q	451	Transistor	2SC2712
Q	452	Transistor	2SC2712
Q	551	Transistor	2SA1145
Q	552	Transistor	2SA1145
Q	553	Transistor	2SC2705
Q	554	Transistor	2SC2705
Q	555	Transistor	2SD2343
Q	556	Transistor	2SD2343
Q	561	Transistor	2SD2438
Q	562	Transistor	2SD2438
Q	563	Transistor	2SB1587
Q	564	Transistor	2SB1587
Q	651	Transistor	2SD1768S
Q	652	Transistor	2SD1768S
Q	653	Chip Transistor	2SA1162
Q	654	Transistor	2SC2458
Q	655	Transistor	2SC2458
Q	656	Transistor	2SC2458
Q	657	Transistor	2SA1048
Q	658	Transistor	2SC2458
Q	659	Transistor	2SA1048
Q	660	Transistor	2SB1243
Q	661	Transistor	2SC2712
Q	662	Transistor	2SC2712
Q	663	Chip Transistor	2SA1162
Q	901	Transistor	2SC2458
Q	902	Transistor	2SA1048
Q	903	Transistor	2SA1048
Q	904	Transistor	2SA1048
Q	905	FET	IRFIZ44N
Q	906	FET	IRFIZ44N
Q	907	Transistor	2SD1864
Q	908	Transistor	2SB1243
D	651	Diode	1SS133
D	652	Diode	1SS133
D	653	Diode	1SS133
D	654	Diode	HZS7L(B2)
D	655	Diode	1SS133
D	656	Diode	HZS7L(A2)
D	657	Diode	1SS133
D	658	Diode	1SS133
D	901	LED	BR4361F
D	902	Diode	ERA15-02VH
D	903	Diode	ERA15-02VH
D	904	Diode	HZS18L(3)
D	905	Diode	1SS133
D	906	Diode	1SS133
D	907	Diode	ESAC25M-02C
D	908	Diode	HZS16L(1)
D	909	Diode	HZS16L(1)
D	910	Diode	ESAC25M-02N
D	911	Diode	1SS133
L	851	Ferri-Inductor	CTF1007
L	852	Ferri-Inductor	CTF1007
L	901	Choke Coil 50H	CTH1142
T	901	Transformer	CTT1034
TH	901	Thermistor	CCX1013
TH	902	Thermistor	CCX1035
S	101	Switch	CSH1029
VR	451	Volume 10kΩ(C)	CCS1240
VR	452	Volume 50kΩ(C)	CCS1242
VR	453	Volume 10kΩ(A)	CCS1241
EF	902	Capacitors	CCG-081
EF	903	Capacitors	CCG-081

RESISTORS

Symbol	No.	Part Name	Part No.
R	121		RS1/10S153J
R	122		RS1/10S153J
R	125		RS1/10S153J
R	126		RS1/10S153J
R	129		RS1/10S123J
R	130		RS1/10S123J
R	131		RS1/10S153J
R	132		RS1/10S153J
R	133		RS1/10S223J
R	134		RS1/10S223J
R	137		RS1/10S222J
R	138		RS1/10S222J
R	141		RS1/10S222J
R	142		RS1/10S222J
R	145		RS1/10S222J
R	146		RS1/10S222J
R	451		RS1/10S473J
R	452		RS1/8S473J
R	453		RS1/10S432J
R	454		RS1/10S432J

=====Circuit Symbol and No.===		Part Name	Part No.
R	455		RS1/10S182J
R	456		RS1/10S182J
R	457		RD1/4PU221J
R	458		RD1/4PU221J
R	459		RS1/10S822J
R	460		RS1/10S822J
R	461		RS1/10S221J
R	462		RS1/10S221J
R	463		RD1/4PU222J
R	464		RD1/4PU222J
R	465		RS1/8S181J
R	466		RS1/10S181J
R	501		RD1/4PU221J
R	502		RD1/4PU221J
R	551		RS1/10S222J
R	552		RS1/10S222J
R	555		RS1/10S822J
R	556		RS1/10S822J
R	557		RS1/10S471J
R	558		RS1/10S471J
R	559		RS1/10S223J
R	560		RS1/10S223J
R	561		RS1/10S153J
R	562		RD1/4PU153J
R	563		RS1/10S153J
R	564		RD1/4PU153J
R	565		RD1/4PU561J
R	566		RD1/4PU561J
R	567		RD1/4PU561J
R	568		RD1/4PU561J
R	569		RD1/4PU473J
R	570		RD1/4PU473J
R	571		RD1/4PU473J
R	572		RD1/4PU473J
R	573		RD1/4PU161J
R	574		RD1/4PU161J
R	575		RD1/4PU161J
R	576		RD1/4PU161J
R	577		RD1/4PU562J
R	578		RD1/4PU562J
R	579		RD1/4PU222J
R	580		RD1/4PU222J
R	581		RD1/4PU473J
R	582		RD1/4PU473J
R	583		RD1/4PU473J
R	584		RD1/4PU473J
R	589	0.22Ω	CCN1013
R	590	0.22Ω	CCN1013
R	591	0.22Ω	CCN1013
R	592	0.22Ω	CCN1013
R	593	0.22Ω	CCN1013
R	594	0.22Ω	CCN1013
R	595	0.22Ω	CCN1013
R	596	0.22Ω	CCN1013
R	597		RS1/2PMF100J
R	598		RS1/2PMF100J
R	651		RD1/4PU393J
R	652		RD1/4PU393J
R	653		RD1/4PU564J
R	654		RD1/4PU564J
R	655		RD1/4PM473J
R	656		RD1/4PM473J
R	657		RS1/10S104J
R	658		RS1/10S472J
R	659		RS1/10S103J
R	660		RD1/4PU222J
R	661		RS1/10S472J
R	662		RD1/4PU221J
R	663		RS1/10S103J
R	664		RD1/4PU473J
R	665		RD1/4PU103J
R	666		RD1/4PU103J
R	667		RD1/4PU222J
R	668		RD1/4PU472J
R	669		RD1/4PU101J
R	670		RS1/10S104J
R	671		RS1/10S221J
R	672		RD1/4PU152J
R	673		RD1/4PU472J
R	674		RS1/10S472J
R	676		RD1/4PU222J
R	678		RS1/10S103J
R	680		RS1/10S223J
R	681		RS1/10S223J
R	682		RS1/8S102J
R	851		RS1/8S471J
R	852		RS1/8S471J
R	853		RS1/10S223J
R	854		RS1/10S223J
R	855		RN1/10SE1002D
R	856		RN1/10SE1002D
R	857		RN1/10SE1002D
R	858		RN1/10SE1002D
R	859		RN1/10SE1002D
R	860		RN1/10SE1002D
R	861		RN1/10SE1002D
R	862		RN1/10SE1002D
R	864		RS1/10S104J
R	868		RS1/10S104J
R	869		RD1/4PU473J
R	872		RD1/4PU473J
R	901		RS1/2PMF561J
R	902		RS1/2PMF220J
R	903		RD1/4PU102J
R	904		RD1/4PU102J
R	905		RS1/10S472J
R	906		RS1/10S103J
R	907		RS1/10S183J
R	908		RD1/4PU100J
R	909		RD1/4PU100J
R	910		RS1/10S153J
R	911		RS1/10S102J
R	912		RD1/4PU272J
R	913		RS1/10S472J
R	914		RS1/10S472J
R	915		RS1/10S472J
R	916		RD1/4PU332J
R	917		RD1/4PU332J
R	918		RD1/4PU220J
R	919		RD1/4PU220J
R	920		RD1/4PU472J
R	921		RD1/4PU472J
R	922		RD1/4PU101J
R	923		RD1/4PU101J
R	924		RS1/2PMF560J
R	925		RD1/4PU560J
R	927		RS1/2PMF561J
R	928		RS1/2PMF220J
R	929		RD1/4PU272J
R	930		RD1/4PU221J

=====Circuit Symbol and No.===Part Name			Part No.
CAPACITORS			
C	121		CKSYB474K16
C	122		CKSYB474K16
C	125		CKSQYB273K25
C	126		CKSQYB273K25
C	129		CFTNA124J50
C	130		CFTNA124J50
C	131		CKSYB184K16
C	132		CKSYB184K16
C	133		CFTNA124J50
C	134		CFTNA124J50
C	451		CCSQCH330J50
C	452		CCSQCH330J50
C	453		CEAS4R7M50
C	454		CEAS4R7M50
C	455		CKSYB224K25
C	456		CKSYB224K25
C	457		CKSQYB473K25
C	458		CKSQYB473K25
C	551		CKSYB104K25
C	552		CKSYB104K25
C	553		CEAS101M10
C	554		CEAS101M10
C	555		CCSQCH680J50
C	556		CCSQCH680J50
C	559		CCSQCH220J50
C	560		CCSQCH220J50
C	561		CCPUSL330J50
C	562		CCPUSL330J50
C	563		CCPUSL330J50
C	564		CCPUSL330J50
C	565		CCSQCH220J50
C	566		CCSQCH220J50
C	567		CFTNA224J50
C	568		CFTNA224J50
C	569		CFTNA224J50
C	570		CFTNA224J50
C	571		CFTNA223J50
C	572		CFTNA223J50
C	573		CFTNA333J50
C	574		CFTNA333J50

=====Circuit Symbol and No.===Part Name			Part No.
C	651	220μF/10V	CCH1036
C	652	470μF/16V	CCH1183
C	653		CEAS470M16
C	654		CEAS220M50
C	655		CFTNA103J50
C	656		CKSQYB103K50
C	657		CKSQYB103K50
C	658		CKSQYB103K50
C	659	470μF/16V	CCH1183
C	851		CCSQCH101J50
C	852		CCSQCH101J50
C	853		CEAL100M16
C	854		CEAL100M16
C	855		CKSQYB472K50
C	856		CKSQYB472K50
C	857		CCSQCH470J50
C	858		CCSQCH470J50
C	859		CCSQCH470J50
C	860		CCSQCH470J50
C	861		CEAS100M50
C	862		CEAS100M50
C	863		CKSQYB103K50
C	864		CKSQYB103K50
C	901		CEAS1R0M50
C	902		CEAS221M10
C	903		CEAS2R2M50
C	904		CEAS1R0M50
C	905		CQMA472J50
C	906		CQMA472J50
C	907	3300μF/16V	CCH1130
C	908	3300μF/35V	CCH1200
C	909	3300μF/35V	CCH1200
C	910		CEAS101M35
C	911		CEAS101M35
C	912		CEAS100M50
C	913		CEAS100M50
C	914		CQMA102J50
C	915		CQMA102J50
C	916		CFTNA224J50
C	917		CQMA102J50
C	918		CKSYB103K50

GM-X422/X1R/UC, GM-X422/X1R/ES, GM-X422/X1R/EW and GM-X322/X1R/UC are constructed the same except for the following:

● Amp Unit

Symbol and Description	Part No.			
	GM-X422/X1R/UC	GM-X422/X1R/ES	GM-X422/X1R/EW	GM-X322/X1R/UC
S901 Switch	Not used	HSH-156	HSH-156	Not used
VR452 Volume 50kΩ(C)	CCS1242	CCS1242	CCS1242	Not used
R469, 470	Not used	Not used	Not used	RS1/10S223J
R869, 872	RD1/4PU473J	RD1/4PU473J	Not used	RD1/4PU473J
R926	Not used	RD1/4PU105J	RD1/4PU105J	Not used
C851, 852	CCSQCH101J50	CCSQCH101J50	CKSQYB471K50	CCSQCH101J50
C861, 862	CEAS100M50	CEAS100M50	Not used	CEAS100M50

6. ADJUSTMENT

There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 DISASSEMBLY

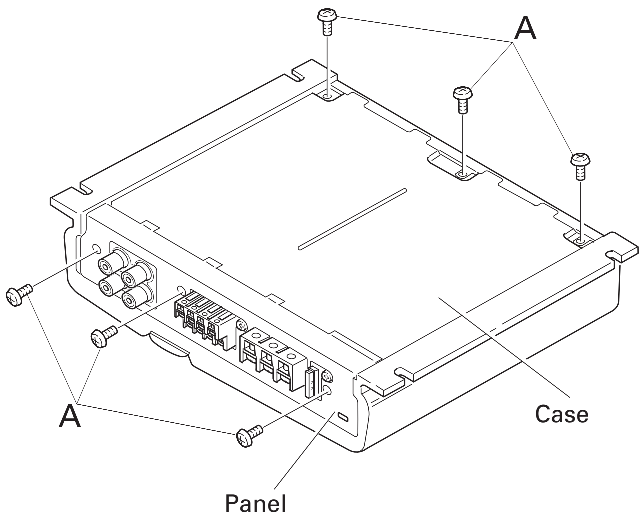


Fig. 6

● Removing the Case and Panel

1. Remove six screws A, and then remove case.
2. Remove panel.

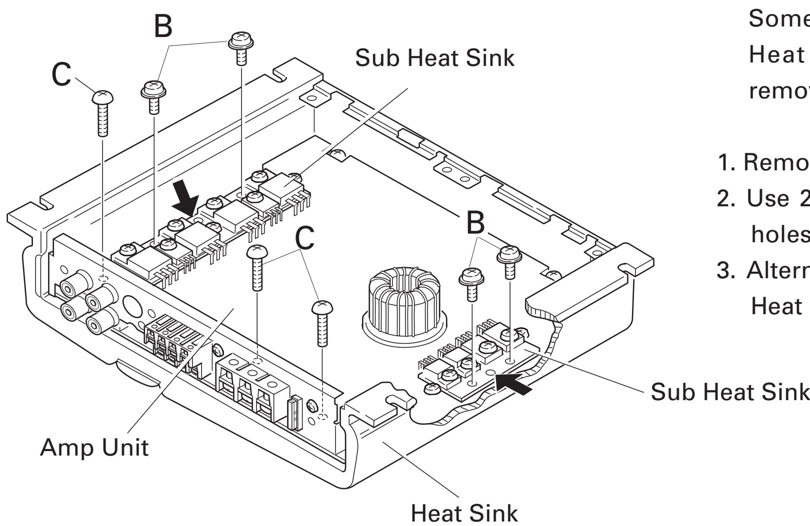


Fig. 7

● Removing the Amp Unit

Some silicone glue has been applied between the Heat sink and the Sub Heat Sink. therefore, to remove the Amp Unit from the Heat Sink.

1. Remove four screws B and Three screws C.
2. Use 2 pcs. of screw B and insert them into the two holes marked with an arrow.
3. Alternately tighten them little by little until the Sub Heat Sink separates from the Heat Sink.

8. OPERATIONS AND SPECIFICATIONS

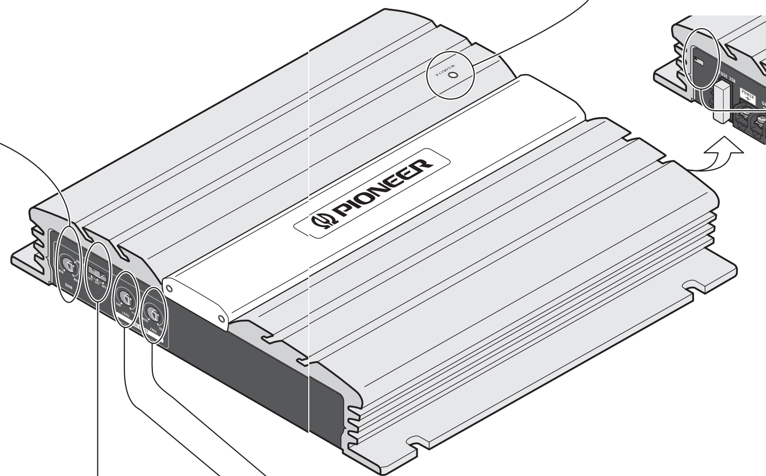
● SETTING THE UNIT

Power Indicator

The power indicator lights when the power is switched on.

BFC (Beat Frequency Control) Switch (ES and EW models)

If you hear a beat while listening to an AM broadcast with your car stereo, change the BFC switch using a small screwdriver.



Gain Control

If the sound is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn gain control on the back of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the gain control counter-clockwise.

- Set the gain control to “NORMAL” when this amplifier is connected to a Pioneer car stereo with RCA output jacks. If the sound is too low or distorts, adjust the gain control.

LPF (Low-Pass Filter)/HPF (High-Pass Filter) Select Switch

Set the LPF/HPF select switch as follows according to the type of the speaker that is connected to the speaker output connector and the car stereo system:

LPF/HPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very-low-frequency range	Sub-woofer	Connect a sub-woofer.
OFF (center)	Full range	Full range	
HPF (right)	Low-frequency range to high-frequency range	Tweeter	If you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

Bass Boost Level Control

Bass boost level control can boost the level around the frequency selected by the bass boost frequency control to 0 to 12 dB.

Bass Boost Frequency Control (GM-X422)

You can select a bass boost frequency from 40 to 120 Hz with the bass boost control.

- Bass Boost Level Control, Bass Boost Frequency Control can be adjusted only when the LPF/HPF select switch is set to a position other than HPF.

Fig. 8

● CONNECTION DIAGRAM

(1) GM-X422/X1R/UC

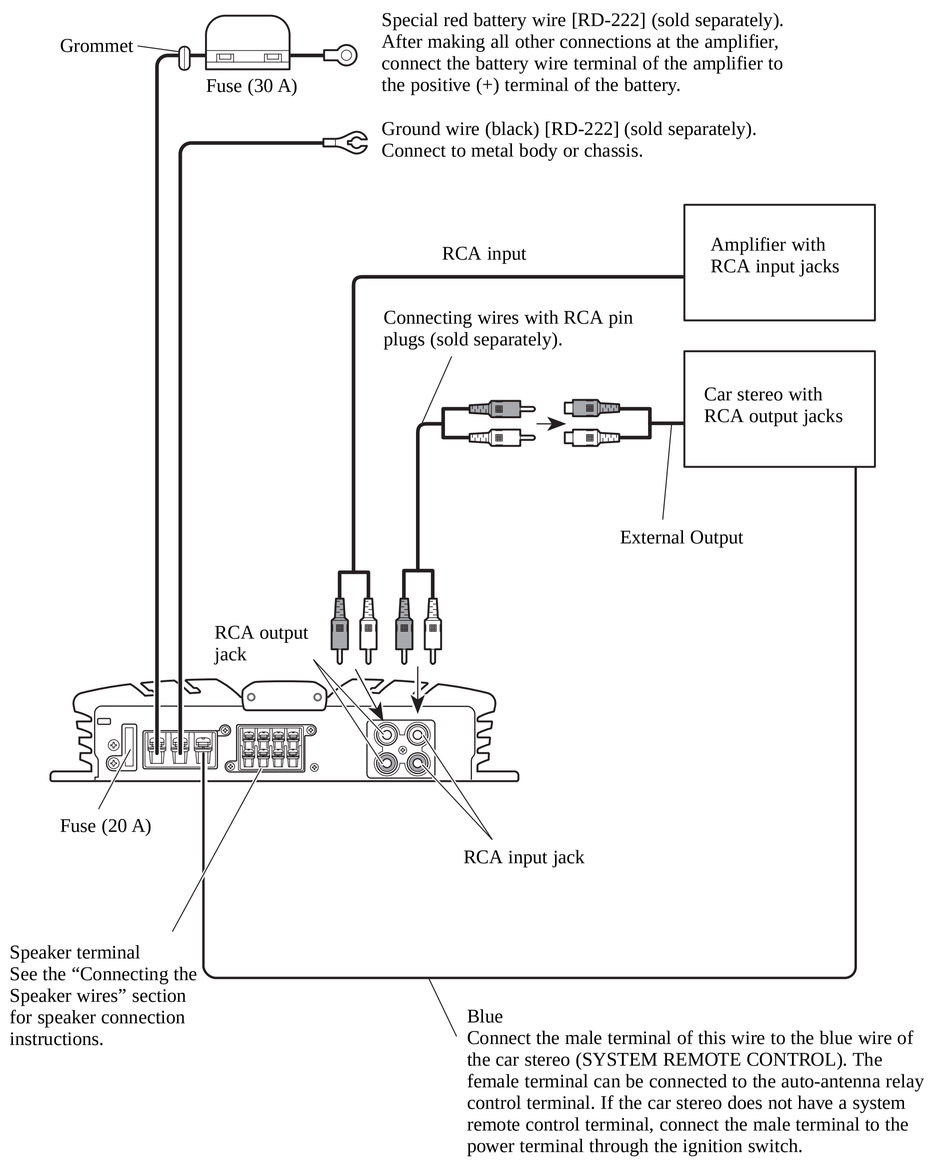


Fig. 9

(2) GM-X422/X1R/ES, GM-X422/X1R/EW

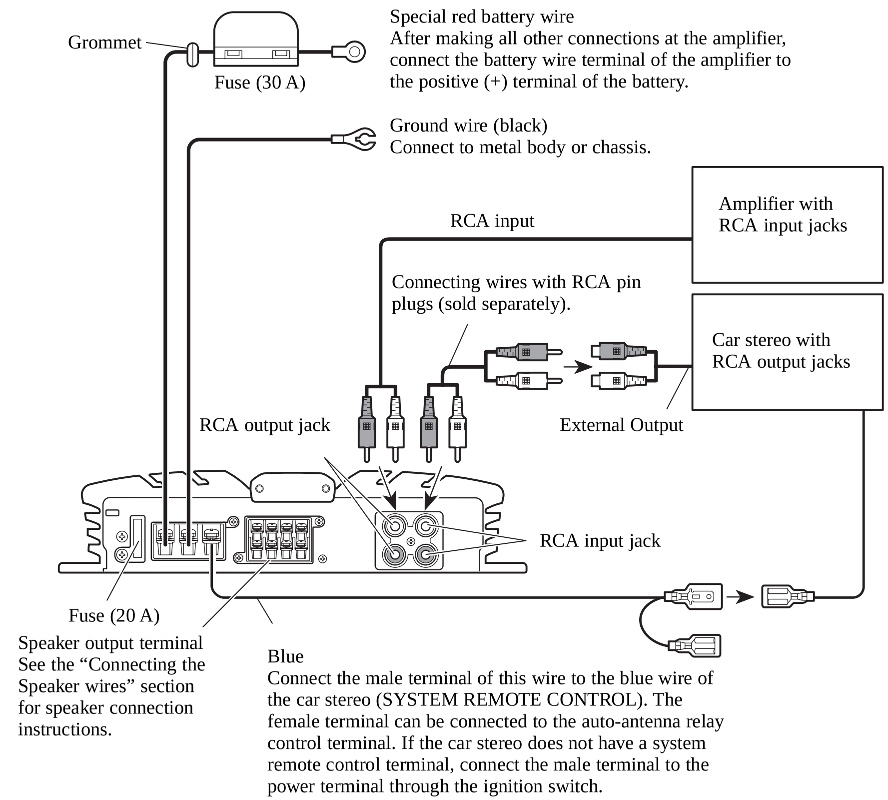


Fig. 10

(3) GM-X322/X1R/UC

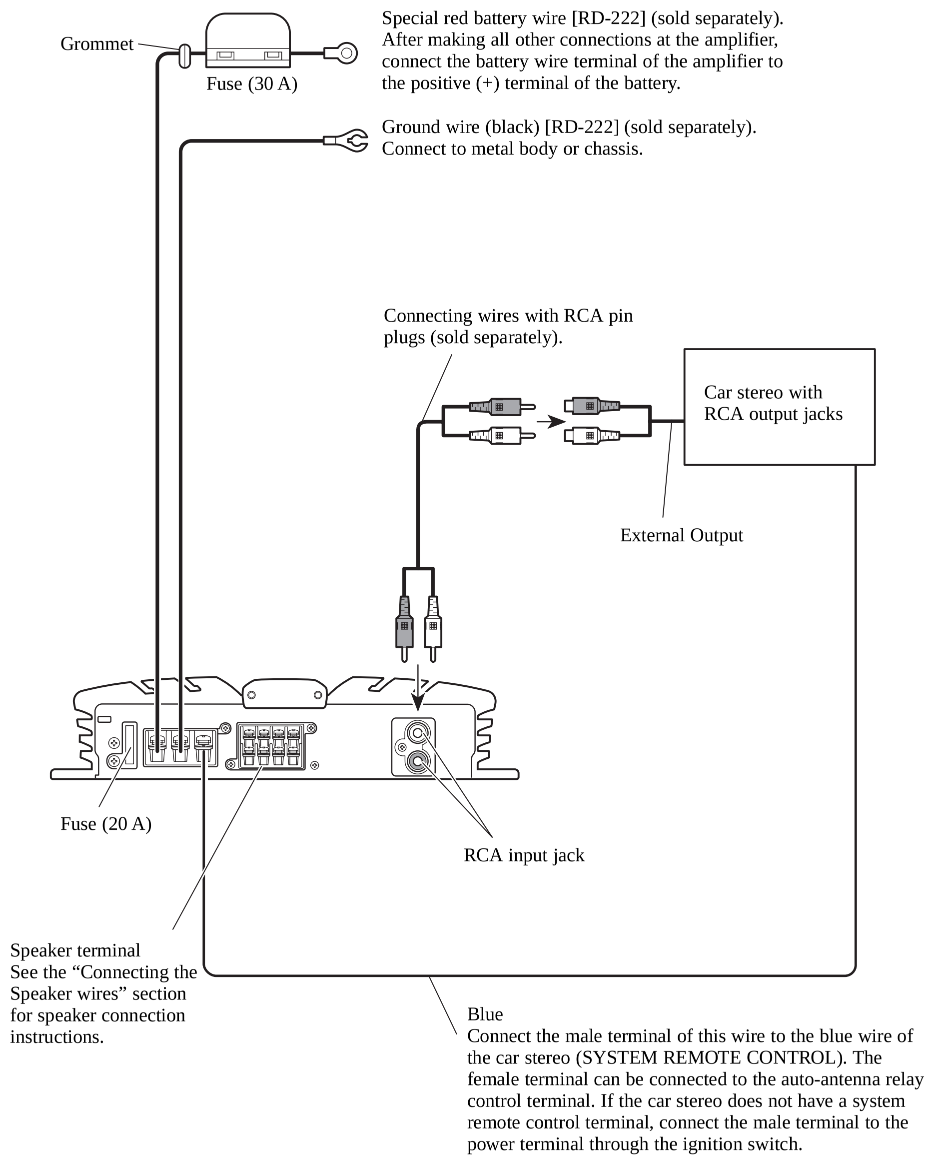


Fig. 11

CONNECTING THE POWER TERMINAL

- Be sure to use the special red battery wire supplied with the amplifier and connect directly to the battery. Use the supplied black ground wire and connect to the vehicle body.

1. Pass the battery wire from the engine compartment to the interior of the vehicle.

- After making all other connections to the amplifier, connect the battery wire terminal of the amplifier to the positive (+) terminal of the battery.

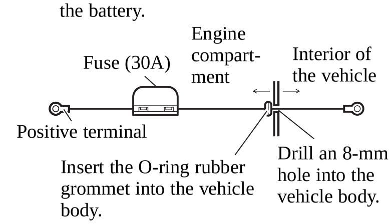


Fig. 12

2. Connect the wires to the terminal.

- Fix the wires securely with the terminal screws.

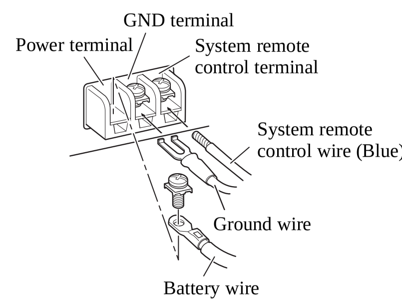


Fig. 13

CONNECTING THE SPEAKER TERMINALS

1. Expose the end of the speaker wires by about 10 mm and twist it using nippers or a cutter.

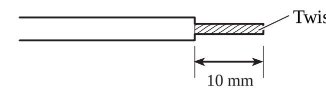


Fig. 14

2. Attach lugs to speaker wire ends.

- Use pliers, etc., to crimp lugs to wires.

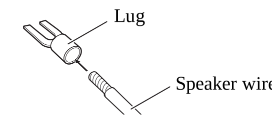


Fig. 15

3. Connect the speaker wires to the speaker terminals.

- Fix the speaker wires securely with the terminal screws.

UC and ES models:

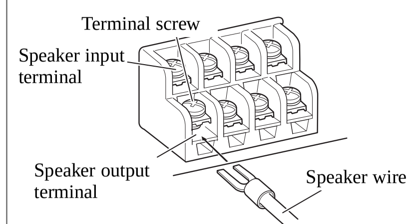


Fig. 16

EW model:

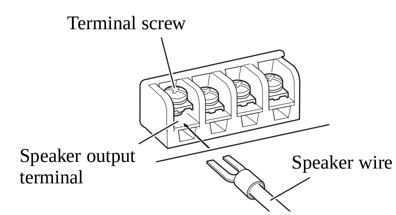


Fig. 17

CONNECTING THE SPEAKER WIRES

(1) GM-X422/X1R/UC, GM-X322/X1R/UC

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker leads to suit the mode. Connect the speakers according to figures on the following pages.

- When connecting to the speaker input, do not connect the RCA output.
- When connecting to the RCA input, do not connect the speaker input.

Two-channel mode (stereo)

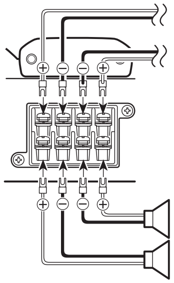


Fig. 18

One-channel mode (mono)

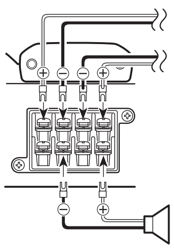


Fig. 19

Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors.

Three-channel mode, two-way system

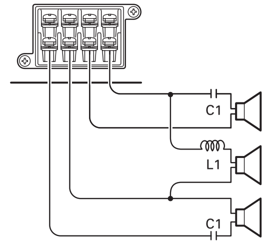


Fig. 20

Three-channel mode, three-way system

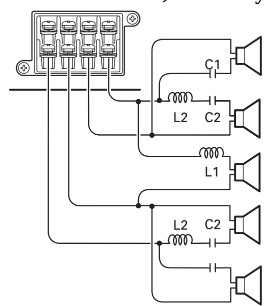


Fig. 21

- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. The inductor (L) shall be used on the woofer/sub-woofer, and that a capacitor (C) shall be used on the high/mid-high.
- Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.
- When the inductors and capacitors are connected to the speaker wires, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.

(2) GM-X422/X1R/ES

The speaker output mode can be two-channel (stereo), one-channel (mono). To connect the speaker leads to suit the mode. Connect the speakers according to figures on the following pages.

- When connecting to the speaker input, do not connect the RCA output.
- When connecting to the RCA input, do not connect the speaker input.

Two-channel mode (stereo)

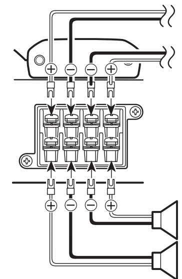


Fig. 22

One-channel mode (mono)

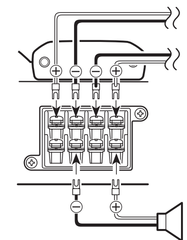


Fig. 23

(3) GM-X422/X1R/EW

The speaker output mode can be two-channel (stereo), one-channel (mono). To connect the speaker leads to suit the mode. Connect the speakers according to figures on the following pages.

Two-channel mode (stereo)

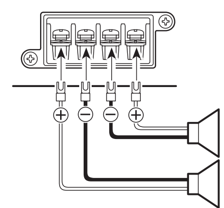


Fig. 24

One-channel mode (mono)

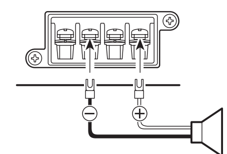


Fig. 25

SPECIFICATIONS

Power source	14.4 V DC (10.8 — 15.1 V allowable)
Grounding system	Negative type
Current consumption	12.5 A (at continuous power, 4 Ω)
Average current drawn*	3.5 A (4 Ω for two channels)
	6.0 A (4 Ω for one channels)
Fuse	20 A
Dimensions	216 (W) × 52 (H) × 175 (D) mm
	[8-1/2 (W) × 2-1/8 (H) × 6-7/8 (D) in.]
Weight	2.1 kg (4.7 lbs.) (Leads for wiring not included)
Maximum power output	70 W × 2 / 160 W × 1 (EIAJ)
Continuous power output (UC and ES models)	35 W × 2 (at 14.4V, 4 Ω, 20 — 20,000 Hz, 0.08% THD)
	80 W × 1 (at 14.4V, 4 Ω, 20 — 20,000 Hz, 0.8% THD)
	50 W × 2 (at 14.4V, 2 Ω, 20 — 20,000 Hz, 0.8% THD)
Continuous power output (EW model)	55 W × 2 / 125 W × 1 (DIN45324, +B=14.4 V)
Load impedance	4 Ω (2 — 8 Ω allowable)
	(Bridge connection: 4 — 8 Ω allowable)
Frequency response	10 — 50,000 Hz (+0 dB, –1 dB)
Signal-to-noise ratio (UC and ES models)	105 dB (IHF–A network)
Signal-to-noise ratio (EW model)	105 dB (IEC–A network)
Distortion	0.004% (10 W, 1 kHz)
Separation	60 dB (1 kHz)
Low pass filter	Cut off frequency: 80 Hz
	Cut off slope: –18 dB/oct
High pass filter	Cut off frequency: 80 Hz
	Cut off slope: –12 dB/oct
Bass boost (GM-X422)	Frequency: 40 — 120 Hz
	Gain: 0 — 12 dB
Bass boost (GM-X322)	Frequency: 60 Hz
	Gain: 0 — 12 dB
Input level / impedance	RCA: 0.4 — 4 V / 22 kΩ
	Speaker (UC and ES models): 1.6 — 10 V / 40 kΩ

Note:
- Specifications and the design are subject to possible modification without notice due to improvements.

***Average current drawn**
- The average current drawn is nearly the maximum current drawn by this unit when an audio signal is input. Use this value when working out total current drawn by multiple power amplifiers.